What is claimed is:

1. An extendable four-port circulator comprising:

a middle birefringent crystal;

a first birefringent crystal;

a first non-reciprocal device coupled to the first birefringent crystal;

a second birefringent crystal;

a second non-reciprocal device coupled to the second birefringent crystal; and

wherein the middle birefringent crystal having

a first surface coupled to the first non-reciprocal device,

a second surface coupled to the second non-reciprocal device,

a third surface defining a first and a second extension interfaces, and

a fourth surface defining a third and a fourth extension interfaces.

2. The extendable four-port circulator of claim 1 further comprising

a first dual fiber collimator coupled to the first birefringent crystal and adapted to be coupled to a first fiber and a third fiber;

a second dual fiber collimator coupled to the second birefringent crystal and adapted to be coupled to a second fiber and a fourth fiber;

3. The extendable four-port circulator of claim 2 further comprising a first wedge placed at a position selected from the group consisting of:

a position between the first dual fiber collimator and the first non-reciprocal device, and

a position between the first non-reciprocal device and the middle birefringent crystal.

4 The extendable four-port circulator of claim 3 further comprising a second wedge placed at a position selected from the group consisting of:

a position between the second dual fiber collimator and the second non-reciprocal device, and

a position between the second non-reciprocal device and the middle birefringent crystal.

5. The extendable four-port circulator of claim 1, wherein the first non-reciprocal device includes two half wave plates coupled to a Faraday rotator.

6. The extendable four-port circulator of claim 1, wherein the first non-reciprocal device includes a half wave plate coupled to two Faraday rotators.

7. The extendable four-port circulator of claim 1, wherein the second non-reciprocal device includes two half wave plates coupled to a Faraday rotator.

8. The extendable four-port circulator of claim 1, wherein the second non-reciprocal device includes a half wave plate coupled to two Faraday rotators.

9. The extendable four-port circulator of claim 1, wherein the polarization of the o-ray in the first birefringent crystal is substantially orthogonal to the polarization of the o-ray in the middle birefringent crystal.

10. The extendable four-port circulator of claim 1, wherein the polarization of the o-ray in the second birefringent crystal is substantially orthogonal to the polarization of the o-ray in the middle birefringent crystal.

11. A multi-port circulator comprising:

a middle birefringent crystal;

a first common non-reciprocal device coupled to the middle birefringent crystal;

a second common non-reciprocal device coupled to the middle birefringent crystal;

a first common birefringent crystal coupled to the first common non-reciprocal device; and

a second common birefringent crystal coupled to the second common non-reciprocal device.

12. The multi-port circulator of claim 11 further comprising

a first dual fiber collimator adapted to be coupled to a first fiber and a third fiber;

a second dual fiber collimator adapted to be coupled to a second fiber and a fourth fiber;

a third dual fiber collimator adapted to be coupled to a fifth fiber and a seventh fiber;

a fourth dual fiber collimator adapted to be coupled to a sixth fiber and an eighth fiber; and

wherein the first common birefringent crystal being coupled to the first and the third dual fiber collimator, and the second common birefringent crystal being coupled to the second and the fourth dual fiber collimator.

13. The multi-port circulator of claim 11, wherein at least one of the common non-reciprocal devices includes two half wave plates coupled to a Faraday rotator.

14. The multi-port circulator of claim 11, wherein at least one of the common non-reciprocal devices includes a half wave plate coupled to two Faraday rotators.

15. The multi-port circulator of claim 11, wherein the polarization of the o-ray in each of common birefringent crystals is substantially orthogonal to the polarization of the o-ray in the middle birefringent crystal.

16. The multi-port circulator of claim 11 further comprising a wedge placed at a position selected from the group consisting of

a position between the first common non-reciprocal device and the middle birefringent crystal;

a position between the second common non-reciprocal device and the middle birefringent crystal,

a position between the first common birefringent crystal and the first common non-reciprocal device, and

a position between the second common birefringent crystal and the second common non-reciprocal device.

17. The multi-port circulator of claim 12 further comprising a wedge placed at a position selected from the group consisting of

a position between the first common non-reciprocal device and the middle birefringent crystal;

a position between the second common non-reciprocal device and the middle birefringent crystal,

a position between the first common birefringent crystal and the first common non-reciprocal device,

a position between the second common birefringent crystal and the second common non-reciprocal device,

a position between the first dual fiber collimator and the first common birefringent crystal,

a position between the second dual fiber collimator and the second common birefringent crystal,

a position between the third dual fiber collimator and the first common non-reciprocal device, and

a position between the fourth dual fiber collimator and the second common non-reciprocal device.

18. The multi-port circulator of claim 11 further comprising a pair of reflectors placed at a position selected from the group consisting of

a position between the first common non-reciprocal device and the middle birefringent crystal;

a position between the second common non-reciprocal device and the middle birefringent crystal,

a position between the first common birefringent crystal and the first common non-reciprocal device, and

a position between the second common birefringent crystal and the second common non-reciprocal device.

19. The multi-port circulator of claim 12 further comprising a pair of reflectors placed at a position selected from the group consisting of

a position between the first common non-reciprocal device and the middle birefringent crystal;

a position between the second common non-reciprocal device and the middle birefringent crystal,

a position between the first common birefringent crystal and the first common non-reciprocal device,

a position between the second common birefringent crystal and the second common non-reciprocal device,

a position between the first dual fiber collimator and the first common birefringent crystal,

a position between the second dual fiber collimator and the second common birefringent crystal,

a position between the third dual fiber collimator and the first common non-reciprocal device, and

a position between the fourth dual fiber collimator and the second common non-reciprocal device.

20. The multi-port circulator of claim 11 further comprising a reflector placed at a position selected from the group consisting of

a position between the first dual fiber collimator and the first common birefringent crystal,

a position between the second dual fiber collimator and the second common birefringent crystal,

a position between the third dual fiber collimator and the first common non-reciprocal device, and

a position between the fourth dual fiber collimator and the second common non-reciprocal device.

21. A multi-port circulator of claim 11 further comprising:

a fifth dual fiber collimator coupled to the first common birefringent crystal and adapted to be coupled to a ninth fiber and an eleventh fiber; and

a sixth dual fiber collimator coupled to the second common birefringent crystal and adapted to be coupled to a tenth fiber and a twelfth fiber.

22. The multi-port circulator of claim 20, wherein at least one of the common non-reciprocal devices includes two half wave plates coupled to a Faraday rotator.

23. The multi-port circulator of claim 20, wherein at least one of the common non-reciprocal devices includes a half wave plate coupled to two Faraday rotators.

24. The multi-port circulator of claim 20, wherein the polarization of the o-ray in each of common birefringent crystals is substantially orthogonal to the polarization of the o-ray in the middle birefringent crystal.

25. A multi-port circulator comprising:

a middle birefringent crystal;

a first and a second common non-reciprocal device each coupled to the middle birefringent crystal;

a first and a third side birefringent crystal each coupled to the first common non-reciprocal device; and

a second and a fourth side birefringent crystal each coupled to the second common non-reciprocal device.

26. The multi-port circulator of claim 25 further comprising a path-conditioning component placed at a position selected from the group consisting of

a position between the first side birefringent crystal and the first common non-reciprocal device,

a position between the second side birefringent crystal and the second common non-reciprocal device,

a position between the third side birefringent crystal and the first common non-reciprocal device, and

a position between the fourth side birefringent crystal and the second common non-reciprocal device.

27. The multi-port circulator of claim 26 wherein the path-conditioning component is a wedge.

28. The multi-port circulator of claim 26 wherein the path-conditioning component is a pair of reflectors.

29. The multi-port circulator of claim 26 wherein the path-conditioning component is a reflector.

30. The multi-port circulator of claim 25 further comprising

a first dual fiber collimator coupled to the first side birefringent crystal and adapted to be coupled to a first fiber and a third fiber;

a second dual fiber collimator coupled to second side birefringent crystal and adapted to be coupled to a second fiber and a fourth fiber;

a third dual fiber collimator coupled to the third side birefringent crystal and adapted to be coupled to a fifth fiber and a seventh fiber; and

a fourth dual fiber collimator coupled to the fourth side birefringent crystal and adapted to be coupled to a sixth fiber and an eighth fiber.

31. The multi-port circulator of claim 30 further comprising a path-conditioning component placed at a position selected from the group consisting of

a position between the first dual fiber collimator and the first side birefringent crystal,

a position between the first side birefringent crystal and the first common non-reciprocal device,

a position between the second dual fiber collimator and the second side birefringent crystal,

a position between the second side birefringent crystal and the second common non-reciprocal device,

a position between the third dual fiber collimator and the third side birefringent crystal,

a position between the third side birefringent crystal and the first common non-reciprocal device,

a position between the fourth dual fiber collimator and the fourth side birefringent crystal, and

a position between the fourth side birefringent crystal and the second common non-reciprocal device.

32. The multi-port circulator of claim 31 wherein the path-conditioning component is a wedge.

33. The multi-port circulator of claim 31 wherein the path-conditioning component is a pair of reflectors.

34. The multi-port circulator of claim 31 wherein the path-conditioning component is a reflector.

35. The multi-port circulator of claim 25, wherein at least one of the common non-reciprocal devices includes two half wave plates coupled to a Faraday rotator.

36. The multi-port circulator of claim 25, wherein at least one of the common non-reciprocal devices includes a half wave plate coupled to two Faraday rotators.

37. The multi-port circulator of claim 25, wherein the polarization of the o-ray in each of the side birefringent crystals is substantially orthogonal to the polarization of the o-ray in the middle birefringent crystal.

38. The multi-port circulator of claim 25 further comprising a wedge placed at a position between one of the common non-reciprocal devices and the middle birefringent crystal.

39. The multi-port circulator of claim 25 further comprising a pair of reflectors placed at a position between one of the common non-reciprocal devices and the middle birefringent crystal.

40. A multi-port circulator of claim 25 further comprising:

a fifth side birefringent crystal coupled to the first common non-reciprocal device; and

a sixth side birefringent crystal coupled to the second common non-reciprocal device.

41. The multi-port circulator of claim 40 further comprising:

a fifth dual fiber collimator coupled to the fifth side birefringent crystal and adapted to be coupled to a ninth fiber and an eleventh fiber;

a sixth dual fiber collimator coupled to the sixth side birefringent crystal and adapted to be coupled to a tenth fiber and a twelve fiber.

42. The multi-port circulator of claim 41, wherein at least one of the common non-reciprocal devices includes two half wave plates coupled to a Faraday rotator.

43. The multi-port circulator of claim 41, wherein at least one of the common non-reciprocal devices includes a half wave plate coupled to two Faraday rotators.

44. The multi-port circulator of claim 41, wherein the polarization of the o-ray in each of the side birefringent crystals is substantially orthogonal to the polarization of the o-ray in the middle birefringent crystal.

45. A multi-port circulator comprising:

a middle birefringent crystal;

a first and a third non-reciprocal device each coupled to the middle birefringent crystal;

a second and a fourth non-reciprocal device each coupled to the middle birefringent crystal;

a first side birefringent crystal coupled to the first non-reciprocal device;

a second side birefringent crystal coupled to the second non-reciprocal device;

a third side birefringent crystal coupled to the third non-reciprocal device; and

a fourth side birefringent crystal coupled to the fourth non-reciprocal device.

46. The multi-port circulator of claim 45 further comprising:

a first dual fiber collimator coupled to the first side birefringent crystal and adapted to be coupled to a first fiber and a third fiber;

a second dual fiber collimator coupled to second side birefringent crystal and adapted to be coupled to a second fiber and a fourth fiber;

a third dual fiber collimator coupled to the third side birefringent crystal and adapted to be coupled to a fifth fiber and a seventh fiber; and

a fourth dual fiber collimator coupled to the fourth side birefringent crystal and adapted to be coupled to a sixth fiber and an eighth fiber.

47. The multi-port circulator of claim 45, wherein at least one of the common non-reciprocal devices includes two half wave plates coupled to a Faraday rotator.

48. The multi-port circulator of claim 45, wherein at least one of the common non-reciprocal devices includes a half wave plate coupled to two Faraday rotators.

49. The multi-port circulator of claim 45, wherein the polarization of the o-ray in each of the side birefringent crystals is substantially orthogonal to the polarization of the o-ray in the middle birefringent crystal.

50. The multi-port circulator of claim 45 further comprising a path-conditioning component placed at a position selected from the group consisting of

a position between the first side birefringent crystal and the first non-reciprocal device,

a position between the first non-reciprocal device and the middle birefringent crystal,

a position between the second side birefringent crystal and the second non-reciprocal device,

a position between the second non-reciprocal device and the middle birefringent crystal,

a position between the third side birefringent crystal and the third non-reciprocal device,

a position between the third non-reciprocal device and the middle birefringent crystal,

a position between the fourth side birefringent crystal and the fourth non-reciprocal device, and

a position between the fourth non-reciprocal device and the middle birefringent crystal.

51. The multi-port circulator of claim 46 further comprising a path-conditioning component placed at a position selected from the group consisting of

a position between the first dual fiber collimator and the first side birefringent crystal,

a position between the first side birefringent crystal and the first non-reciprocal device,

a position between the first non-reciprocal device and the middle birefringent crystal,

a position between the second dual fiber collimator and the second side birefringent crystal,

a position between the second side birefringent crystal and the second non-reciprocal device,

a position between the second non-reciprocal device and the middle birefringent crystal,

a position between the third dual fiber collimator and the third side birefringent crystal,

a position between the third side birefringent crystal and the third non-reciprocal device,

a position between the third non-reciprocal device and the middle birefringent crystal,

a position between the fourth dual fiber collimator and the fourth side birefringent crystal,

a position between the fourth side birefringent crystal and the fourth non-reciprocal device, and

a position between the fourth non-reciprocal device and the middle birefringent crystal.

52. The multi-port circulator of claim 51 wherein the path-conditioning component is a wedge.

53. The multi-port circulator of claim 51 wherein the path-conditioning-component is a pair of reflectors.

54. The multi-port circulator of claim 51 wherein the path-conditioning component is a reflector.

55. The multi-port circulator of claim 45 further comprising:

a fifth non-reciprocal device coupled to the middle birefringent crystal;

a fifth side birefringent crystal coupled to the fifth non-reciprocal device;

a fifth dual fiber collimator coupled to the fifth side birefringent crystal and adapted to be coupled to a ninth fiber and an eleventh fiber;

a sixth non-reciprocal device coupled to the middle birefringent crystal;

a sixth side birefringent crystal coupled to the sixth common non-reciprocal device; and

a sixth dual fiber collimator coupled to the sixth side birefringent crystal and adapted to be coupled to a tenth fiber and a twelfth fiber.

56. The multi-port circulator of claim 55, wherein at least one of the common non-reciprocal devices includes two half wave plates coupled to a Faraday rotator.

57. The multi-port circulator of claim 55, wherein at least one of the common non-reciprocal devices includes a half wave plate coupled to two Faraday rotators.

58. The multi-port circulator of claim 55, wherein the polarization of the o-ray in each of the side birefringent crystals is substantially orthogonal to the polarization of the o-ray in the middle birefringent crystal.